

## **SANITARY SEWERAGE SYSTEM**

### **ISSUES**

Fairfax County provides sewer service to its citizens through a system of over 3,100 miles of sewer lines, 60 pumping stations and one treatment plant owned and operated by the County. Additional treatment capacity is provided by contractual agreements with the District of Columbia, the Alexandria Sanitation Authority (ASA), Arlington County and the Upper Occoquan Sewerage Authority (UOSA). During the 2003 through 2010 planning period, the County will provide both increased treatment capacity and improved effluent quality. Additional plant capacity will be required to serve projected residential and nonresidential growth. Stringent water quality standards require the greater treatment efficiency provided by advanced wastewater treatment.

Financing of the capital program for the sanitary sewerage system is derived from two sources: the sale of revenue bonds and current system revenues. While federal and state grants were extensively utilized to fund the construction programs of the 1970's and 1980's, the financial burden of future programs will fall heavily on the County due to scarcity of federal grant funds. The County has recently signed a grant agreement with the state of Virginia which provides funding for a fifty percent of the plant upgrade costs to remove nitrogen.

In August 1986 new 1986 floating rate sewer revenue bonds were issued. These bonds were converted to fixed rate bonds in FY 1989. The \$75,000,000 sewer revenue bonds are payable solely from the revenues of the Integrated Sewer System and are not general obligations of Fairfax County. These bonds were refinanced in FY 1993 to take advantage of the lower interest rates.

The sewer revenue bonds were issued to provide funds for expanding treatment facilities at the Noman M. Cole, Jr. Pollution Control Plant and Fairfax County's share of expanding facilities at the District of Columbia's Blue Plains Wastewater Treatment Plant. The Noman M. Cole, Jr.

Pollution Control Plant was expanded from 36 million gallons per day (MGD) to 54 MGD. The Blue Plains wastewater Treatment Facility was expanded from 309 MGD to 370 MGD. Fairfax County's allotment of Blue Plains Capacity increased from 16.026 MGD to 31 MGD.

In July 1996, the County sold another \$104 million in Revenue Bonds to finance the expansion of the Noman M. Cole, Jr. Pollution Control Plant to 67 MGD. The \$104,000,000 sewer revenue bonds are payable solely from the revenues of the Integrated Sewer System and are not general obligations of Fairfax County. Approximately 90 percent of the System's revenues are derived from charges to new and existing customers through availability fees and sewer service charges, respectively. New customers to the System are charged a one time availability fee per new connection for access to the System. Existing customer charges are based upon the annualized equivalent of actual water consumption during the winter quarter. Availability fees and sewer service charges are established by the Fairfax County Board of Supervisors. Since 1979 the Board has used the five year financial projection of available cash balances to determine the appropriate level of availability fees and sewer service charges. The available cash balance reflects the projected sources and uses of funds by new and existing customers. The system allocates operating revenues and expenses, debt service and capital outlay between existing users and new users of the System. The remaining 10% of system revenues are derived primarily from sale of service to wholesale users such as Fairfax City, Herndon, Falls Church, Vienna and Ft. Belvoir, etc.

Looking to the future, there are three major issues facing the integrated sewerage system: A balance must be struck between (1) the necessity of maintaining high levels of water quality (including meeting the one part per million ammonia-nitrogen discharge standard); (2) keeping pace with County growth and (3) achieving these goals in terms of both financial and other resources. To a similar end, consideration must be given to inspecting, repairing and maintaining the system at acceptable service levels. In most instances, annual expenditures for system upkeep will enable the County to avoid costly, major rehabilitation in the future.

The current status of the County's wastewater treatment system, both County-owned and treatment by contract, are described in the following paragraphs.

**Noman M. Cole, Jr. Pollution Control Plant.** The Noman M. Cole, Jr., Pollution Control Plant (NMCPCP) serves the Accotink, Pohick, Long Branch, Little Hunting Creek and Dogue drainage basins. In addition to flows originating within the County, the plant also treats sewage from the City of Fairfax, Fort Belvoir, and part of the Town of Vienna. The Noman M. Cole, Jr. Plant was put on line in 1970 and had an initial design capacity of eighteen million gallons daily (MGD) which was subsequently increased to a rating of thirty-six MGD of advanced treatment in 1978 and again increased to a rating of fifty-four MGD in 1995.

In order to meet the anticipated needs for sanitary sewage service in sheds that contribute to the NMCPCP as well as meet new water quality standards for nitrogen control, a program for expansion of the plant to 67 MGD was initiated in 1992. Construction began in 1997 and is expected to be completed in the year 2003. The Noman M. Cole, Jr. Plant will be capable of handling anticipated flows from its contributory sheds through 2015.

**Alexandria Sanitation Authority.** The Cameron Run and Belle Haven watersheds and the City of Falls Church are served by the Alexandria treatment plant. The Alexandria plant is owned and operated by the Alexandria Sanitation Authority (ASA). Sixty percent of its capacity is contractually allocated to Fairfax County. The ASA plant has been expanded and upgraded to provide fifty-four MGD of advanced secondary treatment capacity. Fairfax County is allotted 32.4 MGD of capacity. By 2002, flows from Cameron Run, Belle Haven and Falls Church should approach twenty-three MGD which will leave Fairfax County with unused capacity of several years beyond that time. By reactivating the Braddock Road and Keene Mill Road pumping stations, the County has the capability to divert flow from the Accotink watershed to ASA. These diversions will increase the County's wastewater management alternatives in the entire eastern portion of the

County by off loading the Cole and Blue Plains Treatment Plants to the ASA plant. The ASA Plant is currently under going a major rehabilitation project to meet new water quality standards for nitrogen removal, which should be completed over the next three years.

**Blue Plains.** With a current capacity of 370 MGD, the District of Columbia Water and Sewer Authority (DCWASA) treatment plant at Blue Plains is the largest plant in the area. In addition to the District of Columbia, it treats flows from Maryland, Virginia, and several federal installations. Wastewater flows originating in the Sugarland Run, Horsepen Creek, Difficult Run, Scotts Run, Dead Run, Turkey Run, and Pimmit Run watersheds are treated at Blue Plains. Fairfax County is presently allocated 31.0 MGD at the plant.

Blue Plains will be under going a major renovation over the next several years in the chemical additions and sludge disposal systems. The County's potential share of this renovation will be \$56,271,000 over the next eight years.

**Arlington County Pollution Control Plant.** The Arlington County pollution control plant serves that portion of Fairfax County within the Four Mile Run watershed. The plant has been expanded and upgraded to thirty MGD of advanced secondary capacity. Over the next five years, the Plant will be upgraded again to revamp its primary and solids handling facilities and to expand it to 40 MGD. Arlington County now handles approximately 2.4 MGD for Fairfax County at the Arlington plant. Projections for 2002 indicate that this level of service will not increase significantly. The total capacity reserved for Fairfax County is 3.0 MGD.

**Upper Occoquan Sewage Treatment Authority.** The southwestern part of Fairfax County is served by a regional plant owned and operated by the Upper Occoquan Sewage Authority. This plant became operational in 1978 and replaced five small treatment plants in Fairfax County (Greenbriar, Big Rocky Run, Flatlick Run, Upper Cub Run, and Middle Cub Run) and six in Prince William County. This plant was originally certified to operate at 15.0 MGD. Fairfax County's initial

share of the plant was 30.83 percent but during 1978 the County purchased additional capacity from Manassas Park which brought the County's share of plant capacity up to 36.33 percent. The County's capacity in the plant was 5.45 MGD before it increased to 9.915 MGD with the expansion of the UOSA plant to 27 MGD in FY 1989. In 1995, the UOSA plant was expanded to 32 MGD. Fairfax County's share was increased to 13.190 MGD. Another expansion effort to 54 MGD has been designed and will raise Fairfax County's capacity to 27.6 MGD to meet capacity demands beyond the year 2010. The construction has been started and funded by the sale of bonds which were sold in 1995. The bonds were issued by UOSA and are subordinate to Fairfax County bonds.

### **COMPREHENSIVE PLAN GUIDANCE**

The Policy Plan primary objectives regarding sanitary sewer emphasizes the need to maintain a system of conveyance and treatment facilities that is responsive and compatible with the land use and environmental goals of the County. The this end, the Plan stresses that the provision of public sewer be in accord with the Board's approved sewer service area and that the expansion of lines and plants be consistent with other facility availability and land use development goals.

### **PROGRAM GOALS**

The primary goals of the Integrated Sewer System Program CIP are as follows:

- 1) To provide treatment facilities that meet applicable effluent discharge standards in the most cost-effective manner possible.
- 2) To provide a system of conveyance and treatment facilities that is responsive to the development goals of the adopted Comprehensive Plan.

- 3) To carry out the necessary renovation and improvements that will permit the entire system to function at a high level of efficiency.
- 4) To extend sewer service within approved areas to those sections of the County where failed or failing septic systems pose a potential threat to the health of County citizens.

### **RECENT PROGRAM ACTIVITY**

Fairfax County has completed the program of plant expansion and upgrading that was begun in the early 1970's. This program was directed at pollution problems in the Potomac River and the Occoquan Reservoir and was comprised of four major elements:

- (1) creation of a single treatment complex at the Noman M. Cole, Jr. plant to treat flows from the Accotink, Pohick, Dogue and Little Hunting Creek Watersheds and Fort Belvoir,
- (2) installation of pumping facilities at the old Westgate treatment plant to divert flows from its service area to the Alexandria treatment plant;
- (3) expansion and upgrading of the District of Columbia Water and Sewer Authority's (DCWASA) treatment plant at Blue Plains to 370 MGD;
- (4) construction of the UOSA plant and eliminating the discharge from the five small County facilities.

### **CURRENT PROGRAM SUMMARY**

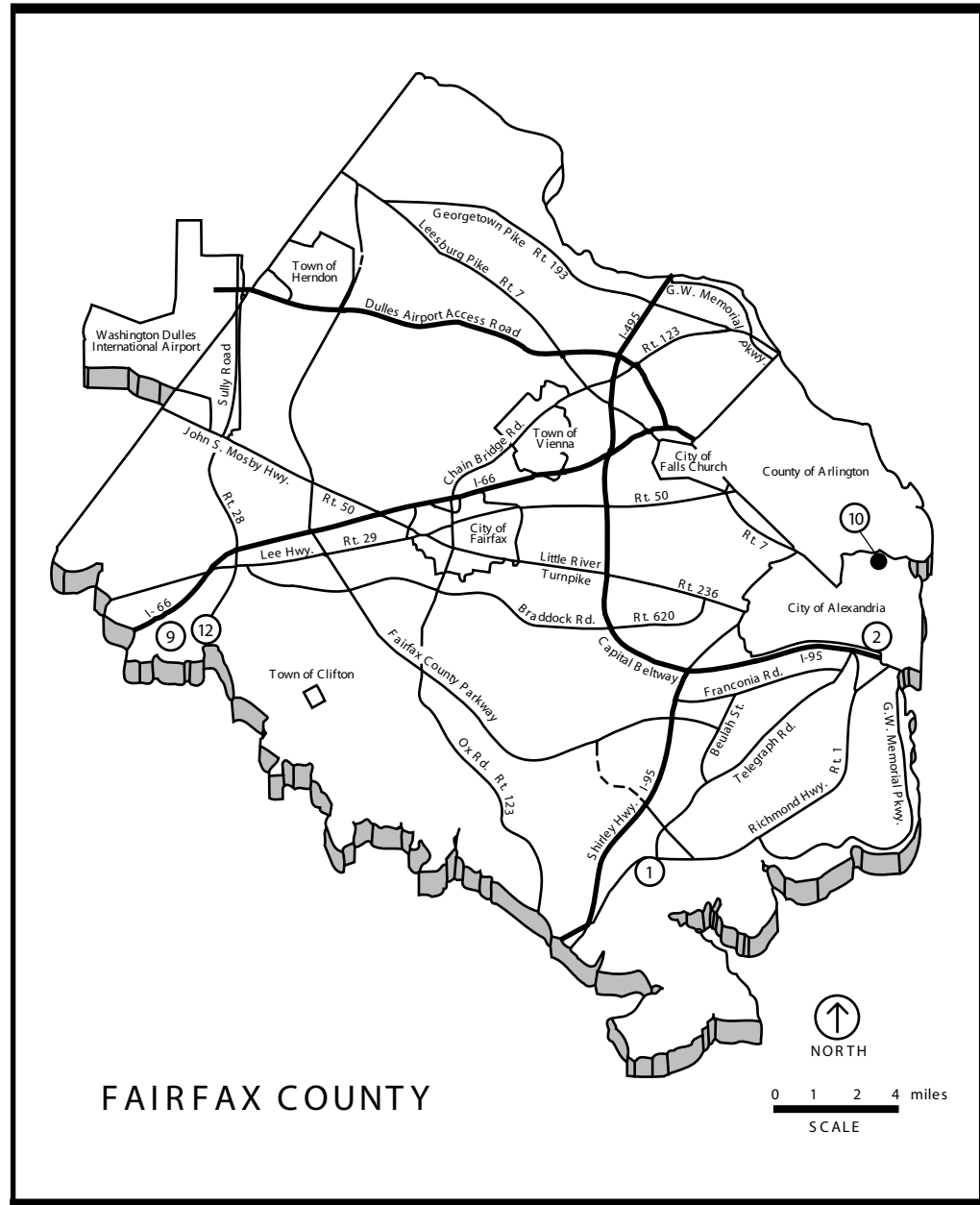
The Sanitary Sewer section includes 12 projects totaling \$1.182 billion for treatment plant expansions and upgrades and system improvements and extensions. This program area is funded totally from system revenues and revenue bonds.

## PROJECT DESCRIPTIONS

1. **Noman M. Cole, Jr. Pollution Control Plant Construction.** \$239,893,000 for the feasibility study, design and construction to expand the plant to 67 MGD. This capacity will meet the future demands until the year 2017 for the Accotink, Pohick, and Long Branch drainage basins and the City of Fairfax, the Town of Vienna and Fort Belvoir. The project also includes funds to improve treatment by removing nitrogen from the effluent.
2. **Alexandria Wastewater Treatment Plant Improvements.** \$178,467,000 for improvements at the Alexandria wastewater treatment plant. Included is renovation to the carbon absorption system, scum collection system, the dechlorination system and the nitrogen removal system to meet the one part per million ammonia-nitrogen standard. The County will borrow a total of \$90,000,000 from the State Revolving Loan fund to complete this project.
3. **Blue Plains Wastewater Treatment Plant, DCWASA.** \$130,298,000 for the County's share of upgrading to 370 MGD at the Blue Plains treatment plant. Blue Plains will be undergoing a major renovation on the next several years in the chemical additions and sludge disposal systems. The schedule of this renovation will cover the next ten years.
4. **Sewer Line Rehabilitation Program.** This is a continuing project for the replacement, repair, and rehabilitation of sewer lines.
5. **Sewer Metering Projects.** This is a continuing project for the rehabilitation and installation of facilities to measure sewage flows. These facilities permit billing for actual flows as opposed to estimated volumes, permit excessive I/I to be located and remedied, and provide flow data that is required by the State Water Control Board and the EPA.
6. **Sewer System Improvement.** This is a continuing project for the systematic improvements to the sewer collection system and the wastewater treatment plant.
7. **Pumping Station Improvements.** This is a continuing project for replacement and necessary improvements to the system's sixty pumping stations. These improvements do not increase capacity or scope and are related to normal wear and tear, and provide odor control equipment to mitigate odors.
8. **Sewer Extension Projects.** This is a continuing project to complete sewer extension and improvement projects in those areas of the County that are experiencing chronic septic system failures.
9. **Upper Occoquan Sewage Authority (UOSA) Expansion to 54 MGD.** \$517,798,000 to expand the UOSA Regional Plant to 54 million gallons per day thereby increasing the County's share at this facility to 27.6 MGD.
10. **Arlington Wastewater Treatment Plant Upgrade to 40 MGD.** \$11,057,000 for the Fairfax County share of the plant upgrade costs. This project is the result of a new Interjurisdictional Sewer Service Agreement which requires funding from participating jurisdictions, on the basis of their share of sewerage capacity and to meet the one part per million ammonia-nitrogen discharge standard.
11. **Sewer Relocation.** \$2,563,000 for the design and construction to relocate and repair sewers and manholes due to construction by VDOT and the County.
12. **Rocky Run Pump Station Rehabilitation:** \$4,336,000 to enlarge the current pumping station to handle the increase wastewater flow in the Rocky Run watershed. The current pumping station has reached full capacity.

## Sanitary Sewer

1. Noman M. Cole, Jr.  
Pollution Control Plant Construction
2. Alexandria WTP
9. UOSA Expansion
10. Arlington WTP Upgrade
12. Rocky Run Pump Station



**PROJECT COST SUMMARIES  
SANITARY SEWER  
(\$000's)**

PROJECT TITLE/NUMBER (FUNDING SOURCE)/1	TOTAL PROJECT COST	AUTHORIZED/ EXPENDED THRU FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL FY2003-FY2007	TOTAL FY2008-FY2012	ADDITIONAL NEEDED
Sewer Bond Construction										
1. Noman M. Cole Jr Pollution Control Plant Construction N00322, N00321 (SR) (BR)	\$239,893	\$215,665		\$24,228				\$24,228		
Current Capital Requirements										
2. Alexandria WWTP Improvements/ I00904 (SR)	178,467	135,732	23,568					23,568		19,167
3. Blue Plains-370 MGD/ G00901, G00902 /2 (SR) (BR)	130,298	76,898	10,500	8,400	8,200	11,400	8,500	47,000	6,400	
4. Trunk Sewer Rehab./ X00905, L00117, I00905 /3 (SR)	44,300	/3	5,300	6,000	6,000	6,000	6,000	29,300	15,000	
5. Sewer Metering/ X00445 /3 (SR)	830	/3	50	600	10	10	10	680	150	
6. Sewer System Improvements/ X00906, X00910 /3 (SR)	27,397	/3	694	7,163	4,171	3,180	3,189	18,397	9,000	
7. Pumping Station Improvements/ I00351 /3 (SR)	13,800	/3	2,800	2,000	2,000	2,000	2,000	10,800	3,000	
8. Sewer Extension Projects /3 (SR)	11,000	/3		2,000	2,000	2,000	2,000	8,000	3,000	
9. UOSA Expansion To 54 MGD/ XXX /4 (SR)	517,798	183,564	16,010	16,010	16,010	16,010	16,010	80,050	32,020	222,164
10. Arlington WWTP Upgrade To 40 MGD/ G00903 (SR)	11,057	9,057	1,000	500	500			2,000		
11. Sewer Relocation/ X00930 (SR)	2,563	1,563		1,000				1,000		
12. Rocky Run Pump Station Rehabilitation/T00124 (SR)	4,336	2,536	1,800					1,800		
<b>TOTAL</b>	<b>1,181,739</b>	<b>\$625,015</b>	<b>\$61,722</b>	<b>\$67,901</b>	<b>\$38,891</b>	<b>\$40,600</b>	<b>\$37,709</b>	<b>\$246,823</b>	<b>\$68,570</b>	<b>\$241,331</b>

/1 SR = Systems Revenues, BR = Revenue Bonds

/2 This project includes all funds from Funds 530 and 408.

/3 This is a continuing project. Total project cost represent only the five-- year cost. Prior appropriation is not shown.

/4 This is not a County project and construction is through UOSA. The County's financial obligations for this project are paid as debt service from Fund 407.